

With my compliments
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Geyser

WHEN IS ELECTRO-THERAPY INDICATED?

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WHEN IS ELECTRO-THERAPY INDICATED? *

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In order to answer that question, it will be necessary to have an appreciation of what is meant by the term electro-therapy. The simple term electricity comprises all the various forms and modalities known to the physician. According to Rockwell, the term electricity is in a way generic and includes a wide variety of manifestations. In medicine, however, we are content with enumerating three principal sources as the direct, the induced, and the static currents. Each of these main currents is capable of extensive subdivision. We thereby find that we have no less than about thirty modifications of the one term electricity, not to mention the various forms of radiotherapy. This at first seems bewildering; nevertheless, each modality has its own limitations and the indications for their applications in therapeutics are almost absolute and unerring. It must not be inferred that these various modalities sprang up like mushrooms over night; on the contrary, nearly every modality and its specific indication and employment in therapeutics is the result of patient labor extending over years of time. Neither is it necessary to point to foreign lands for investigators and advocates of these modalities, for inseparably stand engraved upon the minds of electro-therapeutists the names of Morton and cataphoresis, Newman and electrolysis, Snow and static modalities, Brinkmann and harmonic vibrations, Morton and the wave-current, Cleaves and light therapy. These, and their number is legion, might be cited as the pioneers of electro-therapy. They tried and tested, they became convinced themselves, they convinced others how and when to apply electro-therapy.

I know of no better way of comprehending electro-therapy

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than by comparing it with some well-known drug, for instance opium. We find that opium contains no less than eighteen different alkaloids, each possessing a specific virtue of its own. Then we have twelve officinal preparations of the crude drug. We need go no farther, for we have thirty specific substances. Each is especially prepared and has its own specific indication as well as its specific physiological effect upon the human body, yet all emanating from the one source, "opium."

If we compare the term electro-therapy to opium therapy, we will have no difficulty in understanding that we may have thirty or even more modalities in our electrical applications, each with a different indication and physiological effect, the same as the thirty preparations of opium. It may be reasoned that opium is a highly compound organic body, therefore easily divisible into its component parts.

Mercury, on the other hand, is an inorganic element, yet we have twenty-three well-recognized preparations of this one element. It may further be said that electricity is neither a compound body nor an inorganic element, but simply some attribute of bodies or elements; so is heat, neither a compound body nor an inorganic element, but like electricity demonstrable in a variety of manifestations from such a degree as to fuse the most obdurate metals and again to freeze into a solid mass the liquid metal mercury. Every degree of heat has its own specific properties and these properties cannot be substituted. The same property of heat that will melt ice will not freeze water, yet only an imperceptible difference of one degree exists.

We require no further comparison to understand that electricity as used in medicine may appear in thirty or more modalities, each one produced in a specific manner with its own specific properties, its specific application and specific therapeutic results; that it is not at all a mystery but rather a highly scientific and subtle agent capable of doing much good when properly selected and applied, yet like a double-edged sword, capable of serious harm if improperly made use of. All that may be said of drugs applies equally to electricity and *vice versa*. Electricity like any other single agent is not a panacea for all the ills that flesh is heir to. It has its indications as well as its limitations.—When, then, is electro-therapy indicated?

Before any therapeutic measure is indicated, we must have

a clear conception of the status of the disease. We must have an exact knowledge of the pathological changes that have taken place in the economy, and what is of equal importance, we must know to a certainty the physiological effects of any measure we desire to make use of. Unless these factors are constantly before us, our therapeutic measure, no matter what its name may be, is almost sure to result in failure, if not doing absolute harm. To make my position clear let us imagine a patient with all the symptoms of an acute biliary colic. The patient is seized with a piercing, agonizing pain in the region of the gall-bladder, the abdominal muscles are cramped and tender, the expression distorted and anxious, the patient exhausted, wringing, twisting, and turning, begging for relief or death. There are two conditions presenting themselves. The cause cannot be removed for the present, but the agonizing pain must be subdued, and at once. We know of nothing in the whole field of electro-therapy that can as successfully cope with this condition as the simple injection of 1-4 of a grain of morphine, and in a few minutes our patient is relieved and falls into a quiet and peaceful slumber, giving us an opportunity to apply local heat to facilitate the onward passage of the stone. Here, then, in an acute condition of this kind, materia medica certainly triumphs over electricity. It demonstrates the clearness with which a certain remedial measure is indicated and we have the assurance of results equally gratifying.

Let us suppose another patient suffering from an acute attack of supraorbital neuralgia or any other neuralgia. The main condition that confronts us is as before, the pain, which could be treated again with morphine. But when we reflect a moment, we are forced to the conclusion that the relief of pain is only temporary or will last as long as the effect of the drug does, when the dose must be repeated as well as increased, and as a result of our therapeutic measure we would substitute a worse condition for a bad one. Here, then, morphine should not be used, neither are the coal tar products indicated, but the direct constant current, the positive pole applied over the painful nerve, the negative as near as possible to the spinal origin of the nerve with a current flowing through the meter of not more than three milliamperes. The pain in the nerve will cease within two to three minutes; the treatment should continue for about five minutes and be repeated daily for at least one week,

although the neuralgia may never appear again after the first treatment. It will hardly be necessary to call special attention to the fact that the exciting cause in all cases must be sought and if found removed.

Still another patient is suffering from an acute facial paralysis (Bell's palsy). The immediate condition confronting us is the one-sided paralysis of the muscles of the face. Some anatomical or pathological change has taken place in the nerve brought about usually by pressure in its bony canal which prevents these fibers from performing their function. Our therapeutic indication is some means whereby we may absorb that which is causing the pressure. The first drug that suggests itself is potass. iodide. The next drug required would be strychnine to stimulate muscular contractions, but now we are getting into deep water. We administer K. I. because it is an alterative, and we subject the whole body to this alterative action of the drug when less than 1-5000 part of the body requires it. Then we give strychnine to stimulate a few nerves along with those all over the body that do not require stimulation.

Let me quote a few medical authorities for two reasons. First, to show that nearly all have had good results from electricity in some one of its forms. Secondly, the uncalled-for medicinal treatments advocated.

Wood and Fitz recommend leeches, blisters, salicyates followed by iodides, *electricity* early and mild.

Barthelow advocates pilocarpine for rheumatic cases.

Rosenthal—vapor baths, tenotomy of contractures.

Gowers—inunctions of morphine oleate.

Osler—counter-irritation, massage, and iodides, and the *direct continuous current*.

Strumpel—*weak, direct continuous currents* daily, later *peripheral galvanization* or *faradization* of muscles; he mentions no drugs.

This, then, is another case in which some other therapeutic measure seems more indicated than drugs. I know of no one agent that has given more uniformly good results than electricity in this form of lesion. I would suggest here that no drug be used, but instead apply dry or moist heat to the mastoid region for the sole purpose of increasing the local blood supply. Next with the weakest current from a secondary in-

duction coil cause contractions to take place of those muscles only that appear paralyzed. Should degenerative changes have progressed so far that no contractions take place with this current, then the direct continuous current must be resorted to. This seldom fails. The weakest current that will cause the nerve to transmit impulses is the current indicated. In other words, the nerve and muscle must be made to perform its function with the least amount of disturbance to itself or any other tissue. This, either one or the other electric modality will accomplish.

The previous cases considered were lesions of either nerves of sensation or nerves of motion. Besides the immediate involvement of either nerves of sensation or nerves of motion, we have a large array of conditions where simply function is changed or perhaps entirely arrested. The functional disorders usually are the accompaniment of what is termed the chronic stage of any given disease, and this brings us to the consideration of chronic diseases generally.

If we stop to think for a moment, we realize that in order for a disease to reach the chronic state, it must have passed through the acute and subacute stages without treatment or in spite of treatment. The general system more or less accommodates itself to the results of a number of abnormal conditions; even the heart readily enlarges to overcome either impedance in the blood vessels or leakage of its own valves. The nervous system, though, seems to be obliged to bear the greatest burden here, and the numerous functional neuroses are the result. I will mention just a few of these functional neuroses where electricity is the remedy indicated.

A child is suffering from acute articular rheumatism (I do not like the term, but it designates a condition and we know what it means). The little patient is treated either with the alkaline method or some of the salicylates and iron are prescribed and more or less abatement of the symptoms takes place. In a few weeks or months, the same symptoms reappear. They are a little more prolonged, require more energetic treatment with calomel and salines, and again a semblance of recovery takes place, but a few weeks later one of the functional neuroses makes its appearance; namely, chorea. It must not be supposed that chorea always follows every case of acute rheumatism. On the contrary, I maintain that the

coexistence of chorea and a history of rheumatism is simply incidental. The various attacks of rheumatism have simply undermined the system and toxins of various kinds now circulate in the blood stream. That makes it possible that we have the symptoms of chorea presenting themselves.—What then are the therapeutic indications?

Ziemssen considers arsenic best for idiopathic cases.

Bouchut claims to have cured four hundred and thirty-seven cases in an average of ten days by eserine 1-32 to a half grain for a child seven to twelve years old.

Sinkler employs ether spray or ice to the spine in some cases, best in adults.

Weir Mitchell gives sodium salicylate, probably best in rheumatic cases.

Trousseau employed tartar emetic pushed to tolerance for the worst cases. He usually gave strychnine up to 1 1-5 grain daily.

Fothergill considered strychnine most useful when the cord seems lagging behind in the general evolution of puberty.

Tanner preferred cold shower baths and iron.

Da Costa recommends iron bromide.

Turnbull gave aniline sulphate about a grain thrice daily and acetanilide has been highly praised.

Niemeyer suggests cups or leeches to the sensitive vertebræ.

Radcliffe preferred iron iodide.

Bouchut gives chloral 45 grains daily.

Joffroy employs chloral with cold packs in grave cases with energetic rubbing, castro-veratrine two or three granules every one-half or one-quarter hour until better, or the stomach rebels. In the latter case, add two granules of codeine to each dose. If no better, stop a few hours and begin again with one granule rapidly increased.

For pain, cannabin tannate.

For the heart, digitalin or strychnine.

For digestion disturbance, hyoscyamine, quassin, and pepsin.

For anemia, iron valerianate and arsenious acid; should the patient survive all this, then for insomnia he gives camphor bromide and ergot.

Burggræve—strychnine, hyoscyamine, and the arseniates of iron, zinc, etc.

To brace up the nerves and muscles, a granule of each two

or three times a day, and last, but not least, hydrotherapy and *electricity* are useful.

Your attention must be called to the fact that from all the authorities thus far mentioned, only one advocated electricity, all the others relying mostly upon such drugs as chloral to quiet the muscular twitchings, and arsenic as an alterative. Because practice has shown that a case of chorea improves under the administration of arsenic and iron, just why we do not know. All cases, however, do not improve and some rebel early against arsenic. Here, then, is a condition that calls for one or the other electric modality. My own preference is the high-frequency, high-potential current. It does not matter whether furnished by the static machine or a modern high-tension coil outfit. For electrodes, I use the glass vacuum or glass filled with a solution of salt water. The discharge from such electrodes applied to the skin causes a reddening, a counter-irritating action causing congestion upon the surface and anemia to the underlying structures. When this is applied for fifteen minutes every day, or even twice daily to the entire length of the spine, the nervous twitching, which we term Sydenheim's chorea, will vanish in the course of one week or ten days, when the number of treatments should be reduced, but the individual treatments lengthened. This must be continued according to the chronicity of the case for from four weeks to as many months.

Another functional neurosis is epilepsy. My opinion is that in epilepsy, we are more frequently dealing with a habit disease, a reflex phenomenon which can be brought about by any agent capable of irritating the susceptible psychic condition of the patient. This may be a simple error of accommodation or refraction, a gastro-intestinal disturbance amounting to an autotoxemia, a phymosis, nasal polypi, anal fissure, tape and round worms, etc., etc. If the cause can be discovered, of course it must be removed. Sometimes, however, the cause cannot be discovered or it may have been removed, yet the habit still remains and even insignificant causes are able to produce in a susceptible patient the epileptic attacks. Here, then, symptomatic treatment is indicated. Medical authorities evidently have had no experience with electricity and little or no success with drugs.

A. H. Hamilton gives large doses of bromides at bedtime. Leaman prefers nickel bromide.

Da Costa gives ergot and nickel bromide. The bromide and ergot are prescribed, one making the spinal reflex centers less susceptible, the other contracting the arterioles of the cord, hoping thereby to remove stasis or congestion, but we must remember that every dose of bromide passes through the whole system and not only does it abolish the hyperexcited reflexes, but the normal ones as well, and those of you who are in the habit of seeing many patients under bromide treatment, know whereof I speak when I say that the treatment of epilepsy by bromides or similar life-destroying agents is worse than the disease itself.

Here, again, in electro-therapy, we find a sheet anchor, either the high-tension induced, or the high-frequency currents are indicated. Both of these currents are a positive sedative to the terminal filaments, at the same time acting, especially if a mild treatment is prolonged, as a gentle counter-irritant, causing a local dilatation of the peripheral circulation, and so relieve the congested central nervous system, accomplishing exactly the same results as the drugs mentioned without the unnecessary effects upon the rest of the economy.

Neurasthenia and hysteria are two functional disturbances, usually with undiscoverable causes. Symptomatic treatment again is indicated. The symptoms are, however, so numerous that nearly the entire materia medica has from time to time been called into service only to acknowledge its helplessness; yet how surprising are the results from a few static charges upon the insulated platform. The patient in the course of fifteen to twenty minutes is converted from a state of deep depression to one of well being, or from a state of excitement to absolute calmness, so that it not infrequently happens that a patient has fallen asleep while under treatment.

Let us spend a few minutes' thought to see how this all comes about. The standard text-books tell us that neurasthenia is caused by mental worry or emotions, sexual excesses, alcohol, tobacco, and other stimulating agencies. Assuming then that over-stimulation is the cause, the same text-books inform us under treatment, the internal remedies indicated are arsenic, strychnine, iron, phosphorus, and quinine, each one an acknowledged so-called tonic to the system. Is it good logic

when a man has imbibed just a little too freely of alcoholics and has become in consequence highly nervous and easily excitable, to offer him still more alcohol until the stage of depression asserts itself, and when he is no longer able to receive and respond to external impressions consider him cured of his nervousness or his hyper-excitability? Krowenthal argues that neurasthenia and hysteria cannot be regarded as nervous affections. It is the varying morbid reaction of the cells constituting the individual. Treatment should aim to influence the morbidly reacting cells by changing the environment and by strengthening the cells,—the benefit from which has long been established empirically.

Fortunately, in electro-therapy, we possess an agent, especially in the static current, which is capable of setting up in the tissues a cellular massage. An agreeable impression proceeds from the periphery to the center, the normal rhythm or vibrations of the system which have been disturbed, and are now in discord, soon come under the influence of the static charge and harmony is re-established, by these impressions upon the terminal nerve filaments. So gentle are the impressions because the air surrounding the patient is used as the electrode that not even the hand of the operator offends the already oversensitive organism of the patient. Static insulation then is an anodyne and a restorative, and should the patient later really require a so-called tonic, then where is the tonic that can equal the Morton wave-current from the static machine?

Another class of diseases are those of the glandular system such as Addison's disease and tubercular glands of the neck. Materia medica has nothing to offer in either of these affections. Serum therapy in Addison's disease is just now receiving attention at the hands of John Rogers of New York. Surgery has accomplished something here; but when seen early offer an excellent opportunity for electro-therapy. If a tubercular gland has not yet broken down, the X-ray will certainly contract that gland and all the glands in that neighborhood, thereby shutting in and making a further spread of the disease impossible. But, if the gland has broken down or is about to do so, then the metallic cataphoresis of an electrode of zinc dipped first in dil. sulphuric acid and then in mercury according to the Massey method, is certainly a treatment *par excellence* to be used in conjunction with the gland-contracting power of the X-ray.

In certain benign affections of the skin, one or more of the various electric modalities is unquestionably the therapeutic measure indicated. One of the most common lesions of the face is acne, and yet how difficult to cure. Acne in one of its many forms is usually dependent upon a toxemia of gastrointestinal origin, or it may be due to reflexes or circulatory disturbances associated with the menstrual functions. Of course, always remove the cause, but the sebaceous glands have acquired a habit or have lost their power of contraction to the normal by their continuous dilatation, and though the cause has been removed, the lesion still persists, or upon the slightest provocation returns. Again symptomatic treatment of a local character is indicated. The over-activity of the gland must be inhibited. There certainly is no agent known to-day that can accomplish glandular inactivity quicker than the Roentgen ray. Only a few exposures are required to cause almost a complete inhibition, and as soon as the sebaceous material ceases to accumulate, the glands contract leaving small nodules of simple local congestions which are equally soon absorbed by the application of the high-frequency discharge from the vacuum electrodes. The high-frequency discharges act as powerful local counter-irritants, increasing the local circulation for the purpose of absorbing effete material and supplying the parts with nutrition.

A few malignant affections such as epithelioma, rodent ulcer, lupus vulgaris, etc., have yielded to the influence of the Roentgen ray with cosmetic effects so much superior to any other method of treatment that there exists no room for choice. The question is often asked, Do the Roentgen rays kill or destroy the germs causing the disease? In my opinion, they do not, but by their vibratory influence so affect the cells exposed to their action that they regain their inherent power of destroying the germs and recovering from the disease.

It was not the intent of this paper to bring before you anything new, strange, or startling, but rather to act as a stimulus to someone who either has not yet tried this one therapeutic measure, or to one who by a false process of reasoning may have become discouraged with his results. It has rather been my endeavor to answer the question, "When is Electro-Therapy Indicated?"

Ignoring all fine technicalities, I have explained what is

meant by the term electro-therapy. From certain groups of ailments, a few were selected and the rationale explained. It is not to be inferred that electro-therapy is good for what ails you, or that it should be used to the exclusion of any other therapeutic measure. For again I repeat, three things are absolutely necessary for the successful physician:

First.—Remove the cause.

Second.—Treat the patient and not the disease.

Third.—Before selecting any therapeutic measures, think—and then use common sense.

Discussion.

Dr. Francis B. Bishop, Washington, D. C.: I think Dr. Geyser is on the right track and he has made a great many valuable suggestions. Naturally, I do not agree with him in all his remarks, for we are here to disagree and to bring out different points. I do not believe that the wave-current of which he speaks is a tonic, but that it is absolutely a stimulant. The question arises, do these cases of chorea all require stimulation? Chorea is not always due to congestion of the cord, but to nutritive changes in the cord and in the anterior cornu. The ganglia of the posterior roots act directly as nutritive centers to the fibers that they control and reflexly to the fibers of the anterior cornu. There is no set of ganglia in the whole body so susceptible to treatment and which we can treat so easily as the ganglia of the cord. In these cases I have found that to establish nutrition there is nothing like the modified continuous current. If the choreic movements are in the upper extremities the current is applied directly to the cord governing the cervical plexus. The function of that part of the cord is highly specialized. If we can in this way increase the nutrition we can very markedly modify the choreic condition. Of course it is due to auto-intoxication very frequently, and then when the cause is determined the proper medicinal treatment and diet should also be applied. Neurasthenia may be due to a great many different conditions and they do not all respond in the same way to electrical treatment. Therefore the current must be suited to the individual condition. We may find one man suffering from neurasthenia due to auto-intoxication from the too frequent consumption of nitrogenous food with too little exercise. Another man may be a brain-worker and take too little nutrition and there may ensue neurasthenia from cell exhaustion. In both cases we have cell exhaustion due to diametrically opposed conditions. We may have neurasthenia the result of infectious disease, such as grip, typhoid fever. In all these conditions we should apply the suitable current for

the individual case. The condition of nervous indigestion is reached through the pneumogastric nerve.

The question arises whether we shall use the negative or positive current: one man may stand 3 ma., another twenty-five. While it is very nice to systematize the treatment of nervous diseases by electricity, it cannot be done in every case. A great many cases will not stand the static current, not even the static wave-current, at first.

I think Dr. Geyser is on the right track, but I do not agree with him altogether as to the application of static electricity in nervous conditions. There should be ascertained the exact kind of current suitable to the case.

Dr. G. Betton Massey, Philadelphia: I have been much interested in Dr. Geyser's paper, which is a very clear-cut presentation of many facts. As the last speaker said, however, we are here for mutual friction and the brightening of our faculties. One little point in reference to the doctor's mention of cataphoresis in tubercular glands I object to, that of the association of that method with the X-ray. I doubt whether Dr. Geyser has tried cataphoresis. If so, I think he would not have added the second portion of that phrase. The zinc-mercury cataphoresis will cure any case of even very extended tubercular infiltration of the glands of the neck. Under these circumstances the use of the X-ray is unnecessary, and may have rather a deleterious effect upon the healthy tissue.

I think that part of Dr. Bishop's difficulty in the differential application of electricity would be cleared up if he remembered the dictum of Apostoli, that in the static spark we have a means of differentiating between neurasthenia and hysteria. Apostoli pointed out that neurasthenics did not well stand static modalities but that the hysterical patients will stand all that can be given to them. In a recent case sent to me from Trenton, a woman of thirty-five and so well nourished as to make a diagnosis of neurasthenia uncertain, I employed at first the rest cure for neurasthenia. But the constant current and insulation were most insufferable to her. The method had to be abandoned. I then made the diagnosis of hysteria rather than of neurasthenia by subjecting her to the static sparks, which were not only well-borne, but seemed to be most grateful to her. Under the use of this modality in simple office applications she has rapidly improved.

Dr. Herbert F. Pitcher, Haverhill: I was much pleased with Dr. Geyser's paper, which covered a large territory. I think it is easier many times to tell when to use electro-therapeutics than to choose the particular modality. Although I have been practicing electro-therapeutics for fifteen years I find a good deal of trouble even now in choosing the right current. In the treatment of rheumatism I have found great benefit in using mechanical vibration and radiant heat. Many times the two

combined eliminate the poisons quicker than any other method.

Dr. Charles Am Ende, New York City; In chorea which we assume is produced by a hyperemic condition it seems to me that static stimulation would not be correct. I have used small quantities of nitroglycerine.

Dr. Morris Weil Brinkmann, New York: Personally, I am very thankful to Dr. Geyser for his paper. I think the remarks which have been made were not in the form of a discussion of the paper, but in reality statements of the treatment which the different gentlemen employed for the different conditions as they conceived them. This was not in the spirit of the paper. Dr. Geyser made certain statements which were the cause of the reading of that paper and the paper has fulfilled the object for which it was written. It has described the folly of so many therapists and authorities of prescribing a long series of measures or medicinal agents of a pharmaceutical or chemical character where there was no possible means of analyzing the effect of these agents. Dr. Geyser has analytically described why electro-therapy is indicated, and when it is indicated, in a certain number of cases, and he ought to be congratulated for doing that thing. He made a collection of authorities upon the treatment of one condition and also the statement that if the patients survived these things, possibly electro-therapy might be indicated. Criticisms of methods of treatment are not in line with the paper. Dr. Geyser's statement that we should not treat the disease, but the patient, covers the ground very beautifully and is a very valuable suggestion.

Dr. Francis B. Bishop, Washington: I do not want the society to think for one moment that I was criticising Dr. Geyser's paper unfairly. I said that the paper was written in the right spirit, but as I understand it, the subject is, where shall we use electro-therapeutics? The doctor made some remarks to which I did not agree. I, in a friendly spirit, gave my view and I did not intend to criticise the paper, except upon those points. I stand open to criticism myself. In fact I invite it. No matter how much we know, or think we know, someone else knows just as much, and perhaps more; and only by having our ideas and opinions straightened out and leveled down by honest and open criticism, can we hope to arrive at the truth.

Dr. Brinkmann: I did not intend that this should be personal for anyone, but I did want Dr. Geyser's paper to receive the thoughtful attention of the members in the direction in which it was evidently written.

Dr. Emil Heuel, New York: While I look upon tubercular disease of the glands as a local condition which is often followed ultimately by complications elsewhere I do not believe the local treatment will cure the general tuberculosis, as stated by Dr. Massey.

Dr. G. Betton Massey: Dr. Heuel's statement sounds very

plausible, but his facts are not there. Given a case of tuberculosis, it has been proven in every case that I have had, that if the worst focus is destroyed by sterilization in its center (very gently with two or three milliamperes three times a week of fifteen-minute sittings) that the patient will quickly regain a healthful appearance and take on weight. In the case of one young lady who had had twenty cutting operations on one side of her neck resulting in terrible scarring on that side, I began to treat the most manifest tumors on the other side. The treatment was continued for a year and a quarter, the case being an extremely bad one, but to-day she is perfectly well. She has now a good color, and if there were tuberculosis germs in the other portions of the body they have disappeared. The definite fact is there: that after the cataphoric destruction of the worst foci of infection, coupled possibly with the effect of the mercury on the general system, a cure of the tuberculosis of the whole system was secured.

Dr. Geyser (closes): Dr. Bishop started off by saying that he did not agree with me. I do not believe that there are any two men within my hearing that would absolutely agree in any one given case. In fact, if we all agreed, these meetings could be immediately abandoned; for it is by the diversity of opinions that we arrive at the truth. Dr. Bishop evidently got that somewhat false impression which I tried so studiously to avoid in my opening remarks. I stated that I did not come here to teach those who knew or thought they knew when to use electro-therapeutics. I simply intended the paper for those who had not tried electro-therapy. While I take the discussion in the spirit in which it was given, it was not a discussion of the paper at all, but the individual treatments.

Dr. Bishop would not in chorea use the Morton wave-current, because that is a stimulant, but he did say that he used the continuous current. So long as the treatment has been discussed and so long as the path has led away from the paper, then might I ask Dr. Bishop by what process of reasoning he uses the galvanic current? The idea of my paper was to use reason and thought and not employ a method because other members used it, or because by using it there were good results. That is empirical treatment. The object of my paper was to develop the reasoning power of the person that he might have some tangible idea why he uses a thing, what it will do and what he intends to accomplish.

Dr. Massey objected to the statement concerning the use of the X-rays in tubercular glands. I have treated a great many clinic cases of tubercular glands according to the method laid down by Dr. Massey. Broken-down glands were all over one side of the neck and upon the other side could be felt nodules not yet broken down. Would it be just to the patient, if I knew that the X-ray had a gland-contracting power, to simply

dismiss that patient after treating that one gland by one man's method? Therefore, when the gland has been treated with the zinc cataphoresis, I afterwards use the X-ray for the glands that are not broken down.

Dr. Pitcher says he uses other means of treatment; the same remarks apply to his statements. So long as the physician treats the patient first, his disease secondly, the object of my paper is accomplished.

Dr. Am Ende treats chorea and thinks it due to hyperemia and uses nitroglycerine. I will not put him to the task of stating what he expects to do with the nitroglycerine. He says that nitroglycerine causes congestion of the brain. If we can send a drug to one part of the body and cause no bad effects in another part of the body, I will be the first to use the drug.

Dr. Brinkmann was the only one who seems to have struck the keynote of the paper. He grasped the idea that the paper was intended to take the matter out of the hands of empiricists and cause the physicians to think why they use a certain method. If they remember their pathology and know what change the application of a certain modality will produce they will employ electro-therapy intelligently; otherwise they may use it erroneously.

Dr. Heuel was perfectly right in stating that in treating tubercular glands the disease was not eradicated from the system. For that reason I use the X-ray in the treatment of the glands after using the cataphoresis. In exactly the same rate of proportion that you remove the focus of infection, will the patient for the time being recover.

Dr. Francis B. Bishop, Washington: The question is such a large one that I want to say I am sorry I did not stick to Dr. Geyser's preliminary remarks instead of to the title of the paper. He wants to know why I use the constant current in the treatment of chorea. In my remarks I think I stated that chorea was due to alteration of the nutrition of the spinal cord in the large majority of cases, and I simply use the constant current because I think it is the most rational method of modifying the activity of those cells to which the motor functions refer for their power.



